INTERMOUNTAIN STATION
Central Reference File
No. 0.73

FOREST SERVICE
RECEIVED
APR 17 1937
RESEARCH
INTERMOUNTAIN

APPLIED FORESTRY NOTES

NORTHERN ROCKY MOUNTAIN
FOREST AND RANGE EXPERIMENT STATION

No. 79 Missoula, Montana April, 1937

GROWTH AFTER LOGGING OF LARCH-DOUGLAS FIR STANDS IN NORTHWESTERN MONTANA

Prepared by the Division of Silvics

Growth-after-logging studies for partially cut stands of larch-Douglas fir in northwestern Montana have been recently completed, furnishing for the first time definite information on growth of partially cut stands. 1/ Such information is necessary to predict the volume to be expected at a second cut and should be of particular interest to timberland operators in the larch-fir forests.

Table 1 shows volumes per acre to be expected 10, 20, 30, and 40 years hence when various initial volumes per acre are left after logging. The large increase in volume during the third and fourth decade is caused in part by the large number of pre-merchantable trees, present at the time of logging, that subsequently attained merchantable size. As used in this study lower merchantable limits are: Western larch, 13.1 inches; Douglas fir, lodgepole pine, and ponderosa pine, 11.1 inches; and Engelmann spruce and lowland white fir, 9.1 inches d.b.h. On the average, there were 32 pre-merchantable trees per acre, of all species, which reached merchantable size in 30 years after logging, and 42 trees in 40 years after logging. Volume added by these trees constitutes an important part of the total volume growth made by these stands since logging. In applying these figures, it must be remembered that they are averages based on a number of cut-over stands. Volumes attained by individual stands may exceed or fall short of the averages given in the table.

1/ This note is prepared to make the most important results of the study immediately available. A more complete report will be issued later.

Table 2 shows for western larch, Douglas fir, and Engelmann spruce diameter growth by 10-year periods of trees of a given diameter class at the time of logging.

The study is based on an analysis of growth on 86 sample plots. These plots were located near the junction of Swan Lake and the lower Swan River, and along the Stillwater River west of Kalispell, Montana, and are representative of cuttings made in the larch-fir forests 20 to 40 years ago. Most of the plots were located on fair to good sites. On each plot detailed measurements of each tree were made to determine volume and diameter growth. Average composition of the stands left after logging was Douglas fir 49 percent, western larch 30 percent, Engelmann spruce 15 percent, lowland white fir 3 percent, lodgepole pine 2 percent, and ponderosa pine 1 percent.

Mortality in these stands was found to be very low, averaging only 2 percent for a 30 to 40-year period following logging.

Table 1.--Board-foot volume growth, Scribner rule, in partially cut stands of larch-Douglas fir, site qualities good to fair

Volume of reserve stand per acre				
Reserve stand at time of cutting	After an interval of			
	10 years	20 years	30 years	40 years
Board feet	Board feet	Board feet	Board feet	Board feet
500	1,010	2,350	4,500	7,350
750	1,500	3,050	5,200	8,050
1,000	1,900	3,600	5,800	8,650
1,250	2,250	4,100	6,300	9,100
1,500	2,600	4,500	6,750	9,550
1,750	2,900	4,900	7,200	9,950
2,000	3,200	5,250	7,450	10,300
2,250	3,500	5,600	7,750	10,650
2,500	3,750	5,900	8,050	10,950
2,750	4,000	6,200	8,350	11,200
3,000	4,300	6,500	8,600	11,500
3,250	4,500	6,800	8,850	11,750
3,500	4,800	7,000	9,100	12,000
3,750	5,050	7,300	9,350	12,250
4,000	5,300	7,550	9,600	12,500
4,250	5,550	7,800	9,800	12,750
4,500	5,850	8,100	10,050	13,000
4,750	6,200	8,350	10,300	13,250
5,000	6,400	8,600	10,500	13,500
5,250	6,700	8,900	10,750	13,750
5,500	7,000	9,200	11,000	14,000

Table 2.--Average diameter breast high in inches, before and after partial cutting of the stand, for western larch, Douglas fir, and Engelmann spruce, growing on fair to good sites

Diameter at indicated number of years before cutting		Diameter at time of cutting	Diameter at indicated number of years after cutting			
20 years	10 years		10 years	20 years	30 years	40 years
		Western Larch				
		4.0	5.2	6.6	7.9	
5.2	5.7	6.0	6.6	7.7	8.7	9.4
7.1	7.6	8.0	8.8	10.1	11.3	12.2
8.7	9.4	10.0	10.9	12.1	13.1	13.9
10.8	11.4	12.0	12.8	14.1	14.9	15.9
12.6	13.3	14.0	15.0	15.9	16.8	18.1
14.6	15.3	16.0	16.9	18.1	19.0	19.7
		Douglas Fir				
0.9	1.6	2.0	3.1	4.7	6.2	7.1
2.6	3.4	4.0	4.8	6.1	7.1	7.9
4.7	5.4	6.0	6.7	7.7	8.5	9.3
6.7	7.4	8.0	8.9	9.9	10.8	11.8
8.6	9.4	10.0	11.0	12.2	12.9	13.7
10.4	11.3	12.0	13.1	14.2	15.1	17.0
12.3	13.3	14.0	15.2	16.4	17.2	17.9
14.2	15.2	16.0	17.2	18.2	18.9	19.9
		Engelmann Spruce				
0.7	1.5	2.0	3.9	5.8	7.8	8.7
2.9	3.6	4.0	5.1	6.9	8.5	9.4
4.5	5.3	6.0	7.3	9.3	10.6	11.8
6.4	7.3	8.0	9.4	11.1	12.2	12.8
7.7	8.9	10.0	11.5	13.0	13.9	14.4
10.4	11.2	12.0	13.5	14.9	15.7	16.7